

What is claimed is:

1       1. In a receiver that receives a modulated signal having  
2       multiple levels and having an equalizer with plural  
3       equalization settings for compensating for distortion in  
4       the received signal, a method of selecting one of the  
5       plural equalization settings that provides an optimum  
6       compensation for the distortion, comprising:

7               (A) for each one of the equalizer settings:  
8                       setting the equalizer to the one setting;  
9                       defining valid regions encompassing each of the  
10          multiple levels of said modulated signal and invalid  
11          regions not encompassing the multiple levels;

12               computing a first metric comprising a count of  
13          samples within said invalid regions;

14               computing a second metric comprising  
15          differences less than a predetermined threshold between  
16          pairs of samples falling within the same valid region;

17               combining the first and second metrics to  
18          produced a combined metric for said one setting;

19               (B) choosing the equalizer setting corresponding to  
20          the best combined metric.

1       2. The method of Claim 1 wherein said invalid regions  
2       lie generally between the valid regions.

1       3. The method of Claim 1 wherein each valid region  
2       includes a range of amplitudes within a predetermined  
3       fraction of the amplitudes of the corresponding multiple  
4       level.

1       4. The method of Claim 1 wherein each invalid region  
2       includes a range of amplitudes deviating by more than a  
3       predetermined fraction of a peak amplitude from the  
4       corresponding multiple level.

1       5. The method of Claim 3 wherein the predetermined  
2       threshold corresponds to a fraction less than the  
3       predetermined fraction.

1       6. The method of Claim 5 wherein the predetermined  
2       fraction corresponds to 10% and the predetermined  
3       threshold corresponds to 5%.

1       7. The method of Claim 1 wherein each of the pairs of  
2       samples falling within the valid region comprise two  
3       samples occurring successively.

1       8. The method of Claim 7 wherein a sample intervening  
2       chronologically between the two successive samples but  
3       not falling within the same valid region is ignored for  
4       purposes of determining successive samples.

1       9. The method of Claim 1 wherein the first metric is a  
2       measure of the deviation of samples from valid signal  
3       levels of the multistate signal and the second metric is  
4       a measure of the consistency of samples about each valid  
5       signal level.

1       10. The method of Claim 1 wherein the combined metric is  
2       a difference between said first and second metrics.

1       11. The method of Claim 10 wherein the best combined  
2       metric is the least positive or most negative metric.

1       12. The method of Claim 1 wherein the combined metric is  
2       a ratio between said first and second metrics.

1       13. The method of Claim 1 wherein each equalizer setting  
2       corresponds to a different transfer function of the  
3       equalizer.

1       14. The method of Claim 1 wherein each transfer function  
2       corresponds to a unique set of poles and zeroes  
3       corresponding to a particular reactance.

1       15. The method of Claim 1 wherein the step of computing  
2       the second metric is carried out for sample pairs in each  
3       of the valid regions, the number of differences not  
4       exceeding the threshold being summed across all valid  
5       regions.

1       16. A receiver that receives a modulated signal having  
2       multiple levels, said receiver comprising:

3               an equalizer with plural equalization settings for  
4               compensating for distortion in the received signal; and

5               an adapter for selecting one of the plural  
6               equalization settings that provides an optimum  
7               compensation for the distortion at the output of the  
8               equalizer, said adapter comprising:

9               means for setting the equalizer to the one  
10              setting;

11                   means for defining valid regions encompassing  
12                   each of the multiple levels of said modulated signal and  
13                   invalid regions not encompassing the multiple levels;

14                   means for computing a first metric comprising a  
15                   count of samples within said invalid regions;

16                   means for computing a second metric comprising  
17                   differences less than a predetermined threshold between  
18                   pairs of samples falling within the same valid region;

19                   means for combining the first and second  
20                   metrics to produce a combined metric for said one  
21                   setting and choosing the equalizer setting corresponding  
22                   to the best combined metric.

1                   17. The receiver of Claim 16 wherein said invalid  
2                   regions lie generally between the valid regions.

1                   18. The receiver of Claim 16 wherein each valid region  
2                   includes a range of amplitudes within a predetermined  
3                   fraction of the amplitudes of the corresponding multiple  
4                   level.

1                   19. The receiver of Claim 16 wherein each invalid region  
2                   includes a range of amplitudes deviating by more than a  
3                   predetermined fraction of a peak amplitude from the  
4                   corresponding multiple level.

1                   20. The receiver of Claim 18 wherein the predetermined  
2                   threshold corresponds to a fraction less than the  
3                   predetermined fraction.

1       21. The receiver of Claim 20 wherein the predetermined  
2       fraction corresponds to 10% and the predetermined  
3       threshold corresponds to 5%.

1       22. The receiver of Claim 16 wherein each of the pairs  
2       of samples falling within the valid region comprise two  
3       samples occurring successively.

1       23. The receiver of Claim 22 wherein a sample  
2       intervening chronologically between the two successive  
3       samples but not falling within the same valid region is  
4       ignored for purposes of determining successive samples.

1       24. The receiver of Claim 16 wherein the first metric is  
2       a measure of the deviation of samples from valid signal  
3       levels of the multistate signal and the second metric is  
4       a measure of the consistency of samples about each valid  
5       signal level.

1       25. The receiver of Claim 16 wherein the combined metric  
2       is a difference between said first and second metrics.

1       26. The receiver of Claim 25 wherein the best combined  
2       metric is the least positive or most negative metric.

1       27. The receiver of Claim 16 wherein the combined metric  
2       is a ratio between said first and second metrics.

1       28. The receiver of Claim 16 wherein each equalizer  
2       setting corresponds to a different transfer function of  
3       the equalizer.

1       29. The receiver of Claim 28 wherein each transfer  
2       function corresponds to a unique set of poles and zeroes  
3       corresponding to a particular reactance.